DOCUMENT RESUME

ED 306 166 SO 019 839

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TITLE The Environment: A Global Concern, An Interdisciplinary Approach.
PUB DATE 87
NOTE 19p.
PUB TYPE Guides - Classroom Use - Guides (For Teachers) (052) -- Reports - Descriptive (141)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Chemistry; *Curriculum Development; Educational Improvement; Educational Innovation; *Environmental Education; German; *Global Approach; High Schools; High School Students; *Interdisciplinary Approach; International Studies; *Relevance (Education); Second Language Instruction; Social Studies; Student Interests; *Student Projects; Student Research; World Problems
IDENTIFIERS Environmental Attitudes; *Environmental Awareness; Environmental Issues; Environmental Literacy

ABSTRACT

This document describes an interdisciplinary approach for encouraging students to become more cognizant of environmental concerns. Environmental issues are addressed in high school social studies, chemistry, and German language classes. The objectives of the plan are as follows: 1) develop student awareness of environmental issues and the necessity of developing a "world plan" to balance societal needs; 2) acquaint students with the educational benefits derived from an interdisciplinary approach; 3) improve student awareness of the importance of living in harmony with the environment; 4) encourage student awareness that they live in a global society and of the effects national actions may have on other states; 5) develop student cognizance of the repercussions new technology can have on the environment; 6) encourage student involvement in environmental issues; and 7) develop skills in using community resources related to environmental issues. Students are required to complete one project consisting of a research paper, written assignment, oral presentation, etc. An event held to display student work and allow public officials to speak on environmental issues is described, and activities and possible research topics are discussed for each discipline. Social studies topics include acid rain, nuclear power, and other current issues. Chemistry students chose research questions and developed experiments to investigate their topics. German language students corresponded with students in West Germany and reported on foreign environmental concerns, similarities between U.S. and German concerns/problems, etc. The program is applicable to most disciplines and easily emulated by any school system. A 25-item bibliography is included. (GEA)

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THE ENVIRONMENT

A GLOBAL CONCERN

AN INTERDISCIPLINARY APPROACH

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The origin of our project grew out of a common concern we had with reference to the role our respective disciplines should play in alerting students to the importance of protecting our environment. The project was completed during the 1986-87 school year.

The thrust of our project was threefold. We used an interdisciplinary approach to encourage students to become more cognizant of the common environmental concerns our society has. Hopefully, we inspired them to become actively involved in maintaining or enhancing our quality of life. Finally, we elicited the support of a variety of leaders from all facets of the local and state community.

Description of Our Project:

Our environmental project took students on a journey from the depths of the earth (underground aquaducts) to the lofty heights of the clouds (acid rain). We used an interdisciplinary approach to encourage students in chemistry, social studies, and German to realize there are a multitude of dimensions to the environmental problems. Each of our classes addressed specific

aspects that related to our respective disciplines, but all of our disciplines were united in the desire to improve the quality of our environment. Furthermore, we encouraged students to realize that concern for our environment transcends the provincial atmosphere of our individual classrooms and is a societal problem.

Throughout the school year we engaged students in a variety of activities that promoted student interest and action. We fostered student enthusiasm for improving our environment which was manifested through student involvement in the community.

We stressed a multitude of themes such as nuclear power, science and technology, the energy crisis, use of natural resources, population growth, legal ramfications of environmental actions, pollution, international cooperation, preservation of state and local parks, etc. Students had a wide array of themes to choose from when they selected their individual projects.

General Objectives:

1. Develop student awareness of the complexity of the environmental issues and the necessity to develop a "world plan" that would

balance the interests and needs of the various components of our society.

2. Acquaint students with the educational benefits to be derived from the interdisciplinary approach to education.
3. Help improve student awareness of the importance of human beings living in harmony with their environment.
4. Encourage students to become aware of the fact they live in a global society where the actions of one nation can have dramatic ramifications for other nations of the world.
5. Develop student cognizance of the repercussions new technology can have on the environment and the world community i.e. atomic power, computers, etc.
6. Encourage students to be aware of and involved in local, state, and national environmental issues.
7. Develop skills in using community resources related to environmental issues.

All students were required to do one project during the school year that was related to the environment unit. Projects consisted of research

papers, written assignments, oral presentations, etc. Chemistry, German language, and social studies classes were all involved in the environmental activities.

The highlight of the student activities was the evening program held at our high school in April. The program consisted of the following:

1. A student skit where students represented the various interest groups in our society such as business leaders, environmental groups, politicians, state regulatory agencies, college professors with special environmental expertise, etc.
2. Several excellent displays of student projects.
3. Mr. Elwin Larson, Environmental Services Director for our city, gave a presentation and answered questions about environmental concerns.
4. Refreshments, including atomic punch, were served to approximately 500 students, parents, and interested people in the community.
5. Lunch consisted of a wide variety of German pastries prepared by the German language

students.

Another of our major projects involved developing an interdisciplinary approach to illustrating how the concern for the environment is an international concern. We had students correspond with other students and governmental officials in Germany who supplied us with information on the decline of forests in Germany due to acid rain. Students were encouraged to note similar complications for forests in the United States and Canada.

German language students translated the information received from Germany, Chemistry students were asked to interpret the technical scientific data, and social studies students were involved in analyzing the historical and political data.

A study of the implications of governmental action illustrates one other pertinent project in which students were involved. A selected group of students were asked to contact the appropriate politicians and do research. Students were asked to present their findings in a mock trial and/or oral presentations where they debated the issues. Students made their selections from a wide variety

of topics. For example, some students researched the National Scenic River Status bill which was supported by one of our Senators and which will affect one of the rivers located in our state. Other students studied legislation that was proposed to limit or prohibit advertising by tobacco companies and how this proposed legislation might be a violation of freedom of speech as guaranteed by the First Amendment.

Other activities included visits to a nuclear power plant that is located near our city; speakers from local businesses who explained how they were affected by environmental laws; representatives from the various governmental bodies such as the Army Corps of Engineers; spokespersons from groups concerned about the environment such as the Sierra Club; and speakers from the State Game and Parks Commission who gave their perspective on conservation and environmental issues. Trips were planned for Schramm Park, DeSoto Bend, and Platte River Park. We invited representatives from the Game and Parks Commission, etc. to speak to the students about environmental concerns. We also viewed the NETV documentary "Riders of the Storm: The Challenge of

Non-Point Pollution" which features the effects of pollution on people living in our state.

We as science, social studies, and foreign language educators must avoid the danger of becoming the Rodney Dangerfields of education and not getting any respect. To avoid this dilemma, we must confront relevant world issues such as the environment. Consequently, we tried to incorporate activities in each of our disciplines that would reflect this concern for contemporary environmental issues.

Social Studies Activities:

Nuclear energy/weapons was one of the issues emphasized in the Social Studies classes. Students are growing up in a world of nuclear realities and nuclear concerns. They must become aware of the facts and learn how to deal with them. Students need to be equipped to deal with the issues and controversies raised by the facts. Some of the issues that were addressed included: national security, moral and ethnic considerations, and nuclear power and nuclear weapons. The purpose of the nuclear unit was not to teach students what to think about nuclear issues but rather to think about them.

Social studies books provide little coverage of nuclear issues. So, teachers have to look elsewhere for appropriate materials that discuss nuclear issues. A unit was developed that required students to read primary sources that related to the trials of Alger Hiss and Julius and Ethel Rosenberg. This unit forced students to consider the question of national security and how spies, real or imagined, should be treated. Should nuclear information be limited to specific nations or should some international organization control access to all nuclear information and determine what information, if any, is to be shared with the other members of the world?

A wealth of information can be obtained by students and/or teachers if they will contact their representatives in the House and/or Senate on the federal level. I received numerous materials from my Federal Congressmen such as an information pack titled "Nuclear Energy". These packets contained "Issue Briefs" that provided detailed evaluations of topics such as "Nuclear Power Plant Safety and Regulation" and "The Chernobyl Nuclear Accident: Causes, Initial Effects, and Congressional Response". There are any number of topics related to nuclear energy and

other environmental issues that could be emphasized that students might consider interesting.

Possible Topics for Research in Social Studies Classes:

1. Tobacco: advertising costs, business costs to provide no smoking sections, freedom of speech and the First Amendment, problems with passing laws, etc.
2. Water pollution
3. Effects of agricultural use of fertilizers
4. Compare and contrast the nuclear accidents of Chernobyl and Three Mile Island
5. The effects of population growth on pollution and/or the environment i.e. Mexico City, etc.
6. Acid Rain--U.S. relations with Canada
7. Bhopal disaster in India
8. Research one or more Supreme Court decisions on environmental issues
9. Interview representatives of one or more of the following groups who would be interested in environmental issues: business, government, science, nuclear power plant officials, environmental groups

like the Sierra Club, political leaders, etc.

Science: Environmental Project:

All Chemistry classes were required to complete an environmental project. This activity was part of the interdisciplinary approach. Students studied environmental issues that were chemistry related. As we studied each of the units of chemistry we looked at the related environmental issues. We were also concerned with the implications of this issue as it related to other disciplines, i.e. German and history. Students participated individually or with class members using the following procedure:

Experimentation:

Students had to come up with a question that lent itself to experimentation. They then had to identify the manipulated, responding, and controlled variables. The actual procedure had to be planned and carried out. Data was recorded and graphed and a conclusion formed. The project was displayed at the environmental fair.

Investigation:

Students had to choose an environmental issue to investigate. Students had to do research and their data recorded in the form of a written report accompanied by charts, drawings, posters, diagrams, models, apparatus, set-ups, etc.

Listing of Possible Topics for Chemistry Projects:

1. Carbon Dioxide Pollution
2. Smog Production
3. Chemical Waste Disposal
4. Pesticides
5. Gasoline Additives

Activities for German Language Classes:

Each fourth and fifth year German language student was required to complete a project that related to the environment. The project had to be done in German. The topic selected encompassed family, local, state, or national issues. The ultimate goal was to get students to give some thought to how the three disciplines--social studies, foreign language, and science--are

related. The student's environmental topic was to reflect this awareness.

A student exchange program between the city of Braunschweig in West Germany and our high school has recently been established. As a result, German language students were encouraged to develop projects that illustrated the common environmental concerns that our city and Braunschweig have.

Students from our city who participated in the exchange program in Germany last summer were instructed to be especially cognizant of the German environment and to collect information that would be suitable for study during the current school year. The students were not to limit themselves to local problems. They were to read newspapers, watch television, and note issues confronting the entire country. Special considerations were to be given to the reactions of the German people to the effects of acid rain on the German forests, fallout from Chernobyl, and the replacement of United States nuclear weapons in Germany.

Students who traveled to Germany this past summer have generated much enthusiasm for the environmental unit. Their experiences in Germany

have made them much more aware of how the environmental issue is pertinent to the lives of all citizens throughout the world community. These exchange students have brought an added dimension to our environmental discussion.

The Braunschweig city officials provided us with materials related to the environment. Students not only got a chance to immerse themselves in environmental issues, but they also had the opportunity to refine their foreign language skills by communicating with officials in Braunschweig. They also got to use German language materials when they did their research for individual projects. German language students also did projects related to the topics listed on the social studies list. However, they approached the project from the German perspective and used German skills when appropriate.

Sample Student Activities for German Language Students:

1. Chernobyl: freedom of the press; effects on relations with Germany or other European countries with reference to agricultural products, etc.
2. Forest decline in Germany and ramifications

of it (refer to the appropriate unit in your textbook that relates to this issue)

3. Effects of acid rain on German lakes and ecological system
4. Comparison of a German city and our city with reference to environmental concerns

We felt our unit was a success because we got the students to recognize the importance of having human beings throughout the world live in harmony with their environment. When students completed our unit they had a much greater understanding of their local environment and how it is affected by the various components of our society. Some of our students even got actively involved in projects which resulted in an improvement of our local environment.

Our project could easily be emulated by any school system and infused into most academic disciplines. The future of our environment should be of concern to everyone.

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